

# Ohio's Response to Raccoon Rabies



An Example of  
Strategic Planning

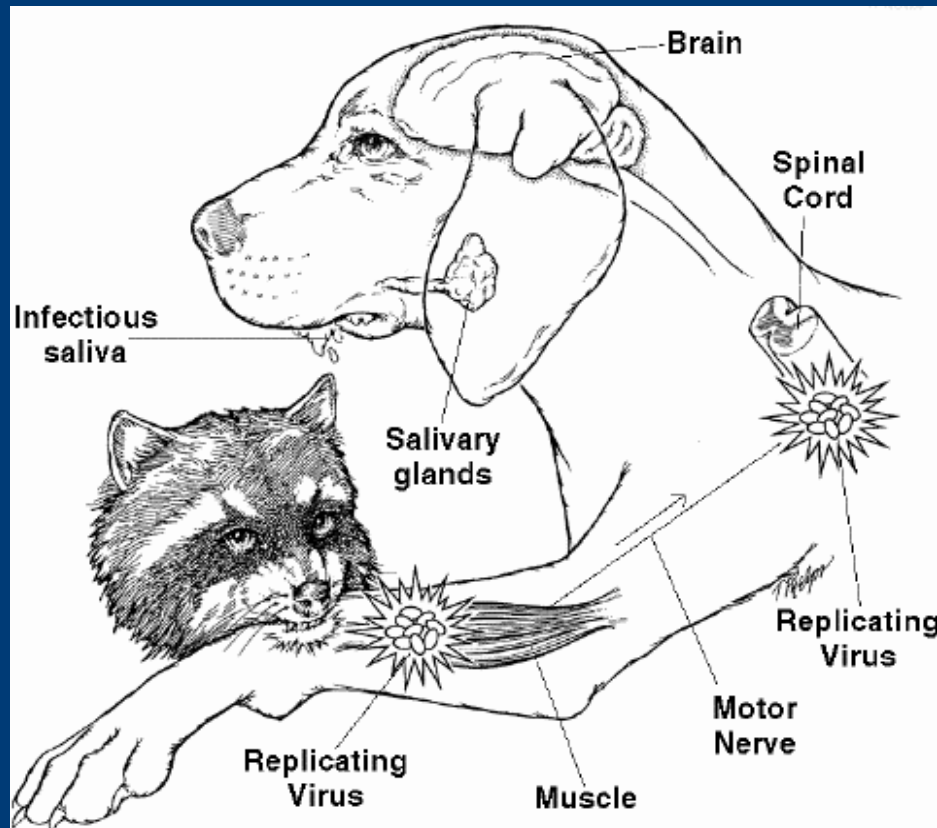
*Kathleen A. Smith DVM MPH*  
*Ohio Department of Health*

# Steps of Strategic Planning

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1. Define the Problem
2. Determine Capacity
3. Describe the Situation
4. Establish Core Planning Group
5. Develop an Action Plan
6. Implement Action Plan
7. Evaluation and Reassess
8. Program Maintenance

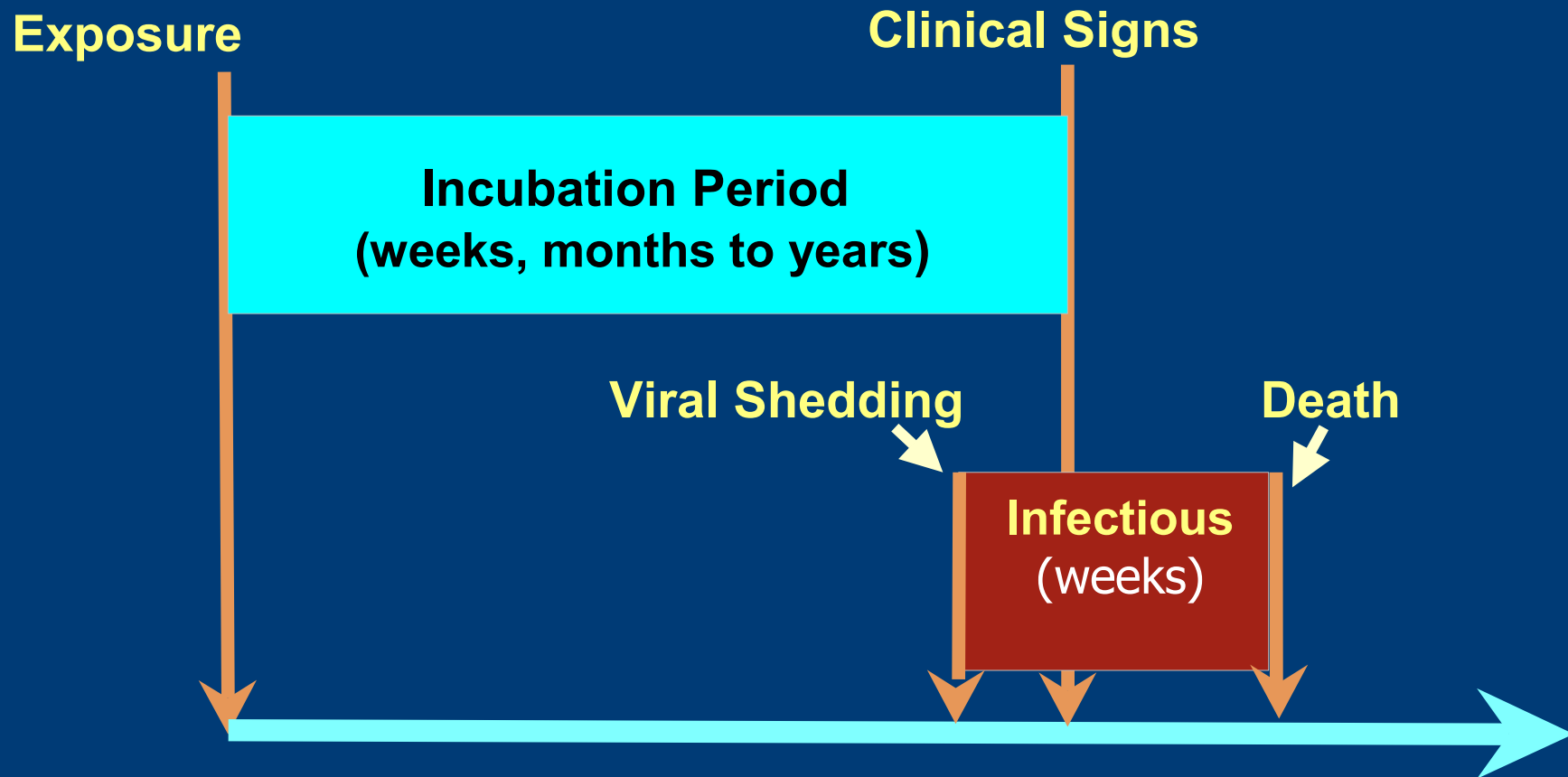
# 1. Define the Problem: Rabies



- Virus Affects mammals
- Targets nervous tissue
- Rabies virus is shed in salivary glands
- Major Mode of Transmission: Saliva into open wound or mucous membrane

# Rabies is Unique

**There is a long time lag between exposure and first sign of illness**



# Unique Aspects of Rabies Infection

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**The virus attaches to nerves, where it is hidden from the victims immune system.**

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There is no early diagnostic test that can tell if a person has been infected. Tests (brain tissue) are only positive late in the disease

Once a person is symptomatic, they are going to die

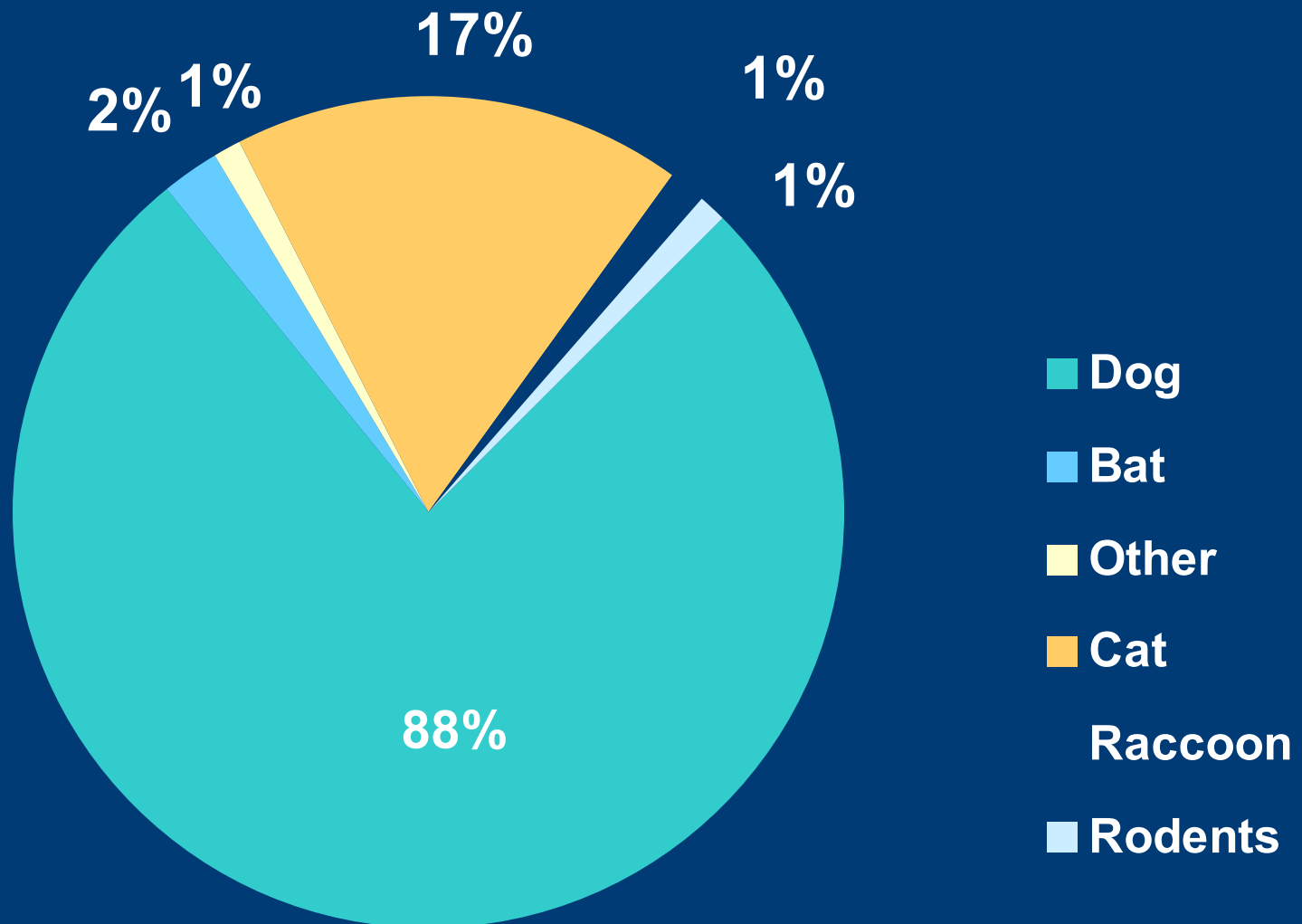
The disease can only be stopped if treatment (series of vaccinations) is started soon after exposure

An immediate risk assessment must be made soon after the exposure.

# Bites/Rabies Exposures

as reported to Ohio local health departments, 2004

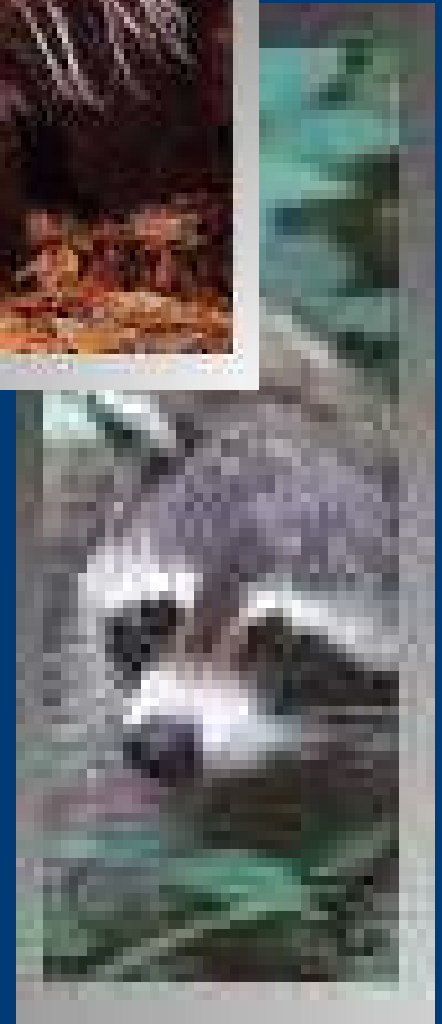
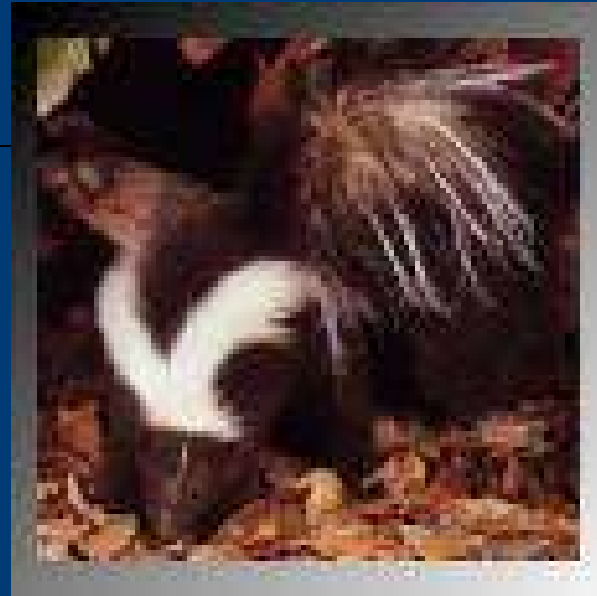
Total = 18,315



# Rabies

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- Rabies is still out there
- People are still out there getting bitten by animals
- Rabies is still a disease of human and animal health significance



# Raccoon Rabies: Additional Concerns

- Ohio's Raccoon population is high
- New disease in a naïve population
- RSR spills over into wide variety of other animals
  - unusual wildlife species
  - dogs and cats
    - especially cats
- Raccoons well adapted to human environment
- People & pets don't leave them alone
- More human exposures
  - PET increases 10 fold

**The Expanding Epizootic of Raccoon Rabies,  
Eastern United States, 1977-1996**



Epizootic convergence between  
Southeastern and mid-Atlantic rabies foci.

SOURCE: MMWR 1996;45:1117.

**CDC**  
CENTERS FOR DISEASE CONTROL  
AND PREVENTION



## 2. Determine Capacity: Pre 1997

- ODH – 1 PHV. Budget \$0.00.
  - About 10 positive animals/year
- LHD Animal Bite & Rabies Control Programs = Unfunded Mandate
- ODNR – Unaware of the potential impact – no resources for disease control. No public health mandate.
- ODA – Aware & concerned about livestock. Supportive – no resources

### 3. Describe the Situation



February 1992: Belmont County

# 1992-1996

- Voluntary Active Surveillance
- Suspect raccoons
  - Sick, acting strange, dead, pet exposure, road kill
- Involved
  - Local Health Depts
  - Veterinarians
  - Nuisance trappers
  - Wildlife Rehabilitators
- 1995 – RSR Written Plan started



## 4. Establish Core Planning Group

### Ohio Rabies Task Force ODH, ODA, ODNR

The purpose of the Ohio Rabies Task Force is to develop and implement a plan to mitigate the impact of a raccoon-rabies epizootic in order to protect Ohio residents, domestic pets and livestock from this deadly disease.

### Goals

- To prevent human cases of rabies
- To prevent domestic animal cases of rabies
- To limit the spread of wildlife rabies within the state

# 1997 Epizootic

**BOARDMAN**

4-16-97

## 3-year-old boy attacked, bitten by stray raccoon

■ The Boardman boy is the first human bitten by a stray raccoon this year in Mahoning County.

By LINDA J. JOHNSON  
VINDICATOR STAFF WRITER

BOARDMAN -- The family of 3-year-old township boy will find out in the next couple of days if he will have to endure rabies.

Jim Shaheen of the Mahoning County General Health District said the boy was bitten on the hand and thigh while riding his bike in the yard of his Terraview Drive home. It is not known yet if the raccoon was rabid.

**March 5 – positive raccoon in Mahoning Co.**

**April 1-7 – EpiAid active surveillance. 12 positive raccoons ID**

**April 14 – 3 yr old boy bitten by rabid raccoon in Boardman**

**April 16 – Quarantine Order signed**

- Vaccination of dogs, cats, and ferrets
- Require proof of vaccination for license
- No dog or cat movement

## 5. Develop an Action Plan

- Review alternatives
- Prioritize
- Estimate Cost
- We had a written proposal ready to go
- We had LHD support
- Timing was right
  - End of FY and \$300,000 in lapsing funds
  - Next biennial budget was under consideration
  - Media was our friend

### Rabies crusade gets booster shot

Tribune Chronicle

COLUMBUS - After a rabid chipmunk recently bit a 12-year-old Trumbull County girl, state government officials announced additional surveillance will be conducted west of Mosquito Creek Reservoir for raccoons carrying rabies.

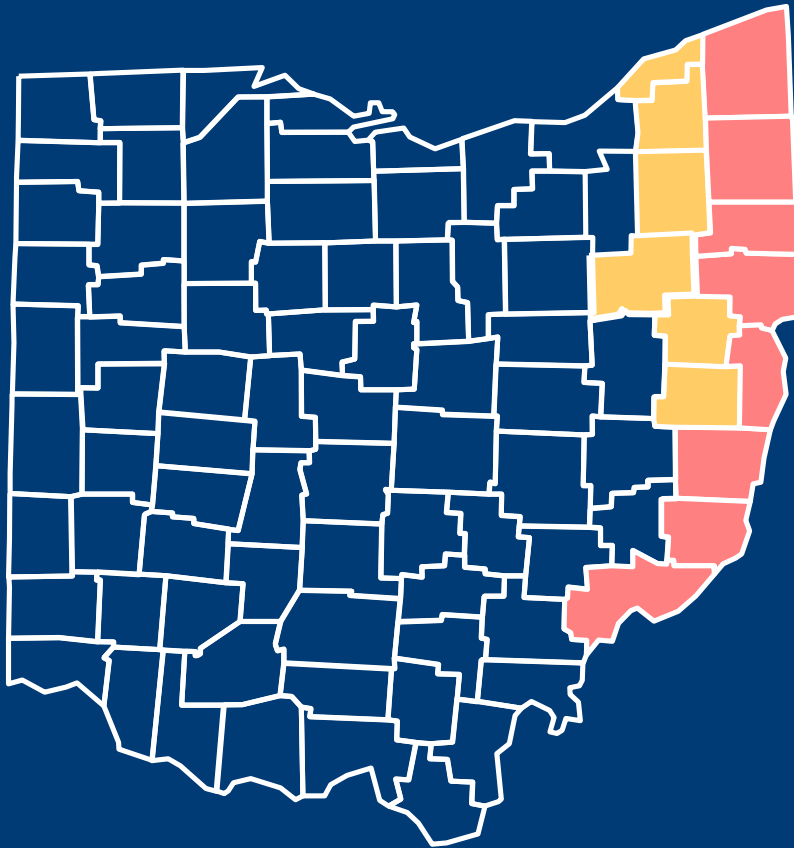
Raccoons are being targeted because testing of the chipmunk showed it was infected with a raccoon-strain of the virus.

The Ohio Department of Health already has placed oral vaccine baits for raccoons on the east side of the lake.

The girl was bitten by the chipmunk when she tried to rescue it from an attack by her pet cat, which had current rabies booster shots.

## 6. Implement Plan

### Target High Risk Counties




# Major Components

- Surveillance
- Education
  - public awareness
  - pet vaccination
  - professional education
- Program to Vaccinate Wild Raccoons (ORV)

# Surveillance... ...is the key!

**WANTED**  
for rabies testing



**Raccoons that:**

- ❖ are sick or acting strange
- ❖ had contact with pets or livestock
- ❖ have bitten or attacked a person

**We need *your* help to stop this dangerous disease.**

For further information:



# Education & Public Awareness

Dear Mrs. Chapman,

Thank you for the coloring books  
and pens. You taught me a lot  
about rabies. I liked the bat and  
raccoon. My mom didn't even  
know all that stuff

Your new  
friend,  
Dakota

## TAKE THE BITE OUT OF RABIES



- Avoid wildlife
- Vaccinate your pets
- Call your doctor if bitten



# Take the Bite out of Rabies



- **AVOID** contact with wild animals and animals you do not know
- **VACCINATE** all your dogs and cats, and keep them current
- **CALL**
  - your doctor, if bitten
  - your veterinarian, if your pet was exposed

***All bites should be reported within 24 hours to the local health department . It's the law.***

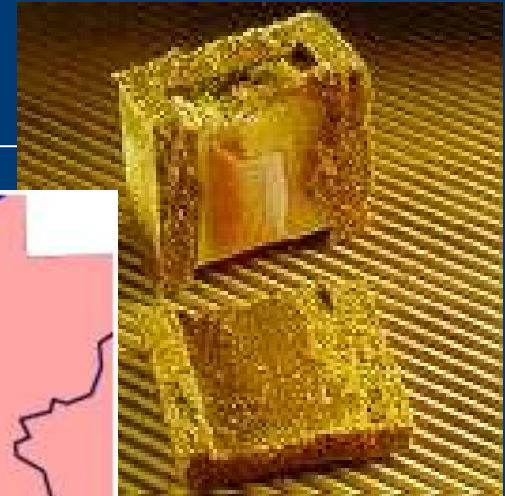
# Oral Rabies Vaccination

## ■ Goals

- Reduce incidence
- Prevent spread

## ■ Assumptions

- An immune barrier will work.
- Natural barriers exist.
- A barrier is more economical than the disease



# The Vindicator

Trumbull Edition

25 cents

## MAHONING VALLEY

# Rabies baiting begins

■ A helicopter has started dropping bait containing rabies vaccine for raccoons in Mill Creek Park.

By LINDA J. JOHNSON  
VINDICATOR STAFF WRITER

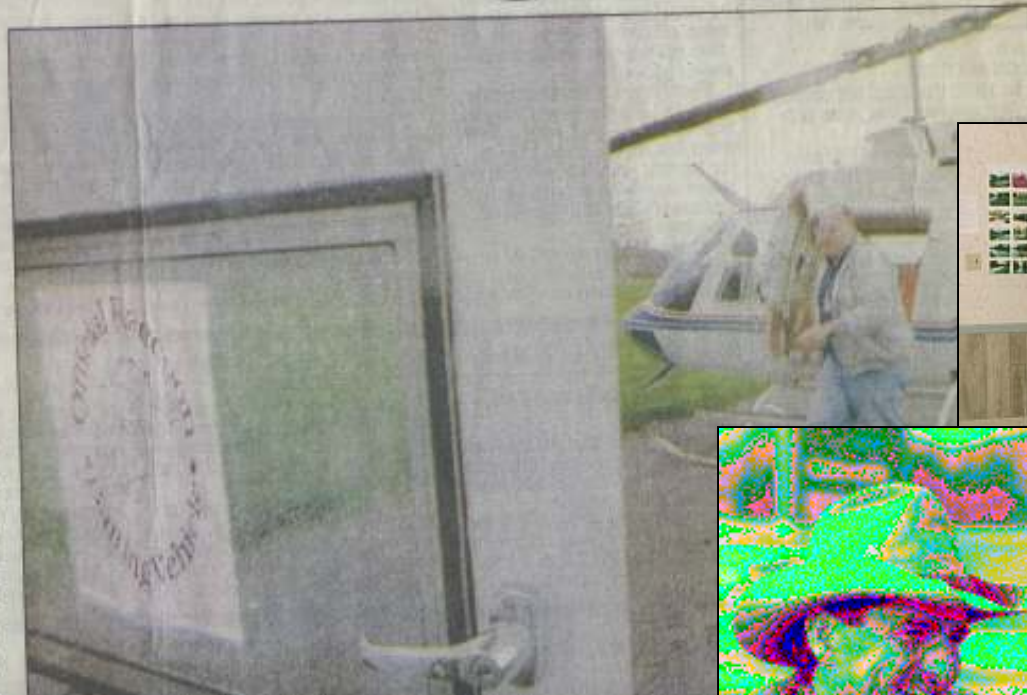
CANFIELD — A small army of federal, state and local workers set out this morning from the Canfield Fairgrounds to distribute a barrier of vaccine to fight the rabies outbreak in the Mahoning Valley.

The rabies vaccine, Raboral-VRG, is inside a two-inch block of fish meal. The fish meal packs are being thrown out of trucks and from a helicopter all this week to stop the spread of raccoon rabies.

The helicopter started at Mill Creek Park, while the trucks targeted suburban areas in Columbiana, Mahoning and Trumbull counties.

Rabies is a deadly disease, and the workers were all business this morning. About 40 people who will be divided into teams of two or three got instructions from officials of the Ohio

Department of Health and the Centers for Disease Control and Prevention in Atlanta.





# ORV Operations

- Began in May 1997
  - Twice/year through 2001
  - Annually since 2002
- Baits distributed at a rate of 1 bait per 3.3 acres
- Distribution is 88% air, 12% ground



## 7. Evaluation of ORV

### ■ Serology

- short-lived indicator of vaccination success
- sample from live trapped raccoons post-baiting
- RVNA by RFFIT

### ■ Tetracycline

- Cumulative indicator of exposure to ORV
- samples = trapped & raccoons submitted for rabies testing

### ■ Case finding

- Active surveillance

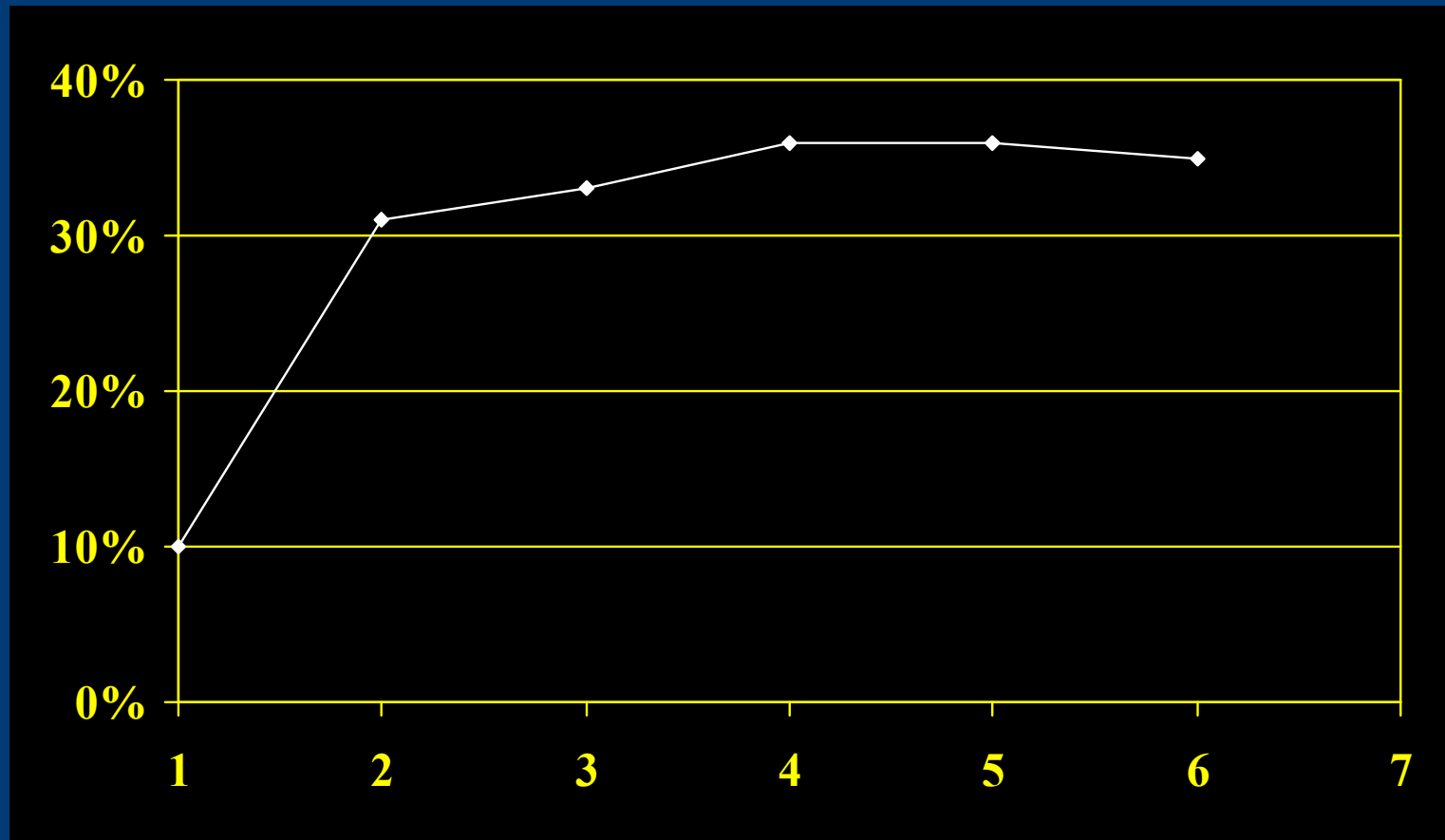


# Post-baiting Serology, Ohio

Year	Pos (>5)/Tested	% Pos (Range)	Comments
1997 Spring Fall	60/125 30/90	34% (31 – 40%) 33% (22-45%)	Biased sampling
1998	133/422	32% (23-38%)	Post-spring only
1999	588	28% (13 – 55%)	Spring only? Bait density study
2000	340	35% (34-36%)	Spring only?
2001 Spring Fall	163/341 16/61	47.5% 26.2%	
2002	11/118	9.32%	Fall only; New bait areas targeted (2x)
2003	45/143	31.5% (14-50%)	Fall only

# Tetracycline Marker vs.. Vaccination Campaigns (1997 – 2001) 634 mandibles)

Tetracycline Positive Mandibles

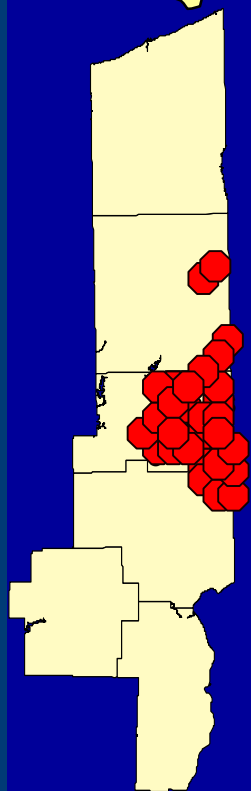


Cumulative Vaccination Campaigns





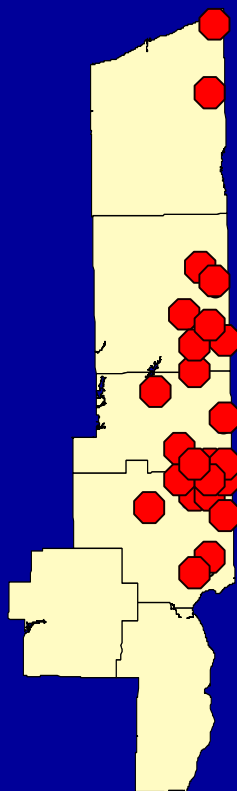
# Ohio Raccoon-Strain Rabies



**1997**

**62**

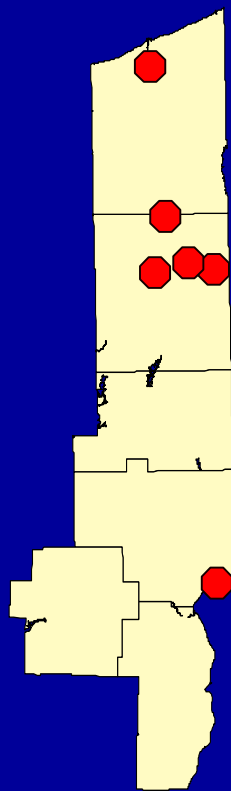
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**1998**

**26**

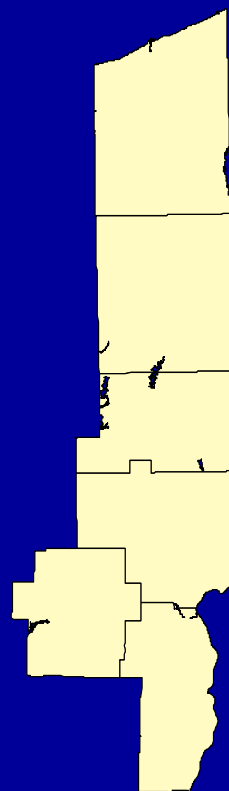
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**1999**

**6**

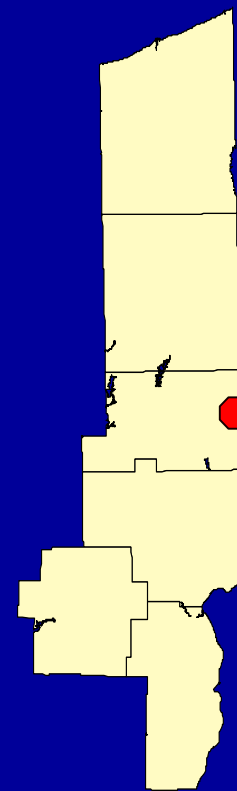
**2\*x**



**2000**

**0**

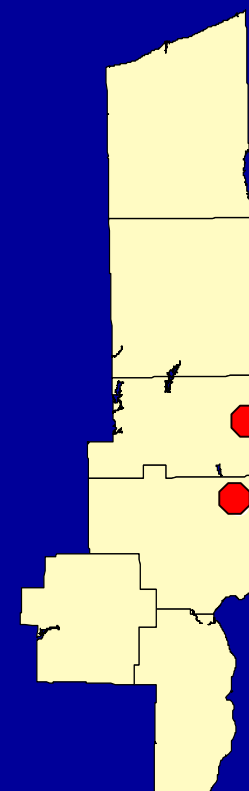
**2x**



**2001&2**

**1 ea**

**2x 1x**



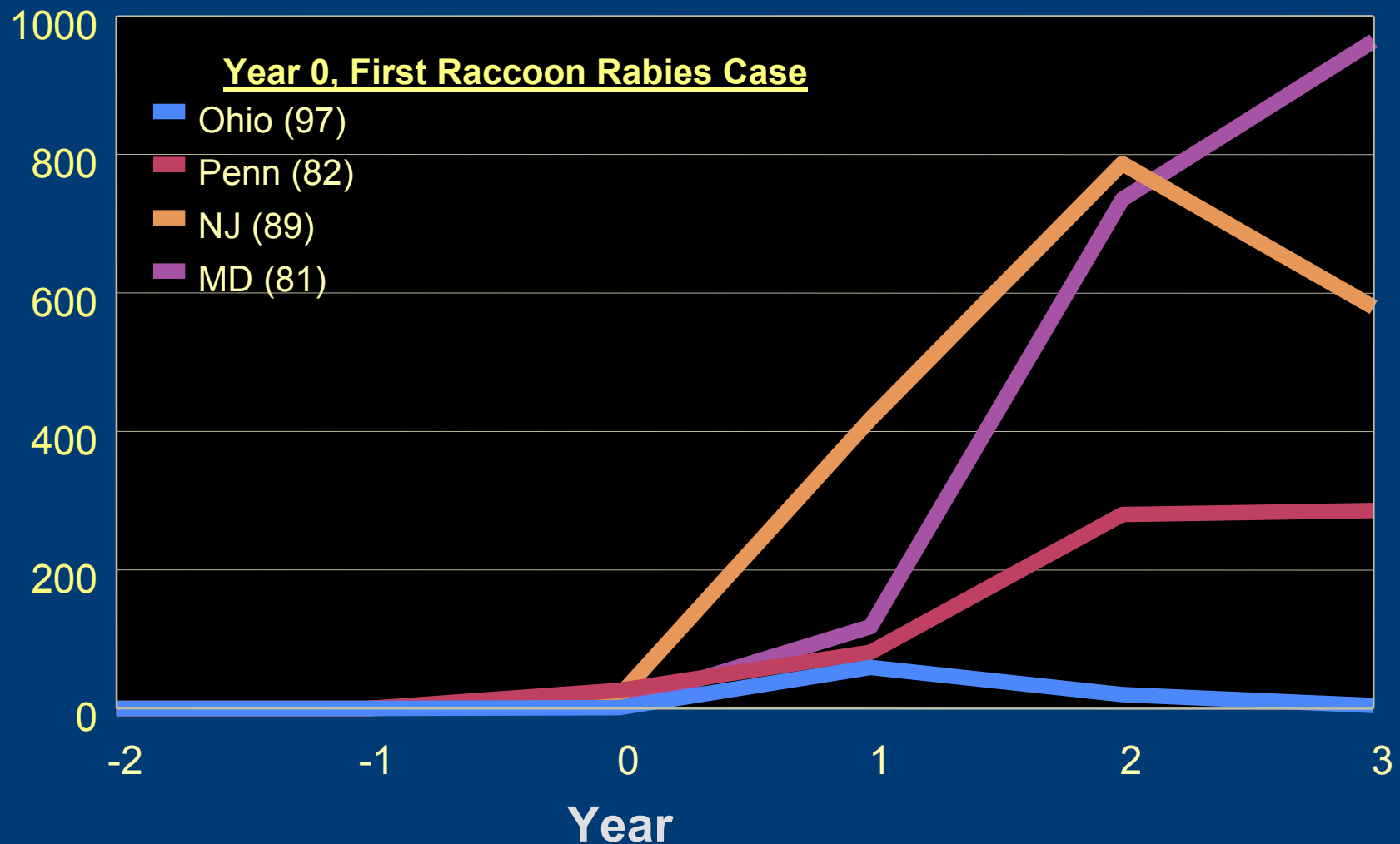
**2003**

**2**

**1+x**

# Raccoon Rabies Epizootic: The First Years

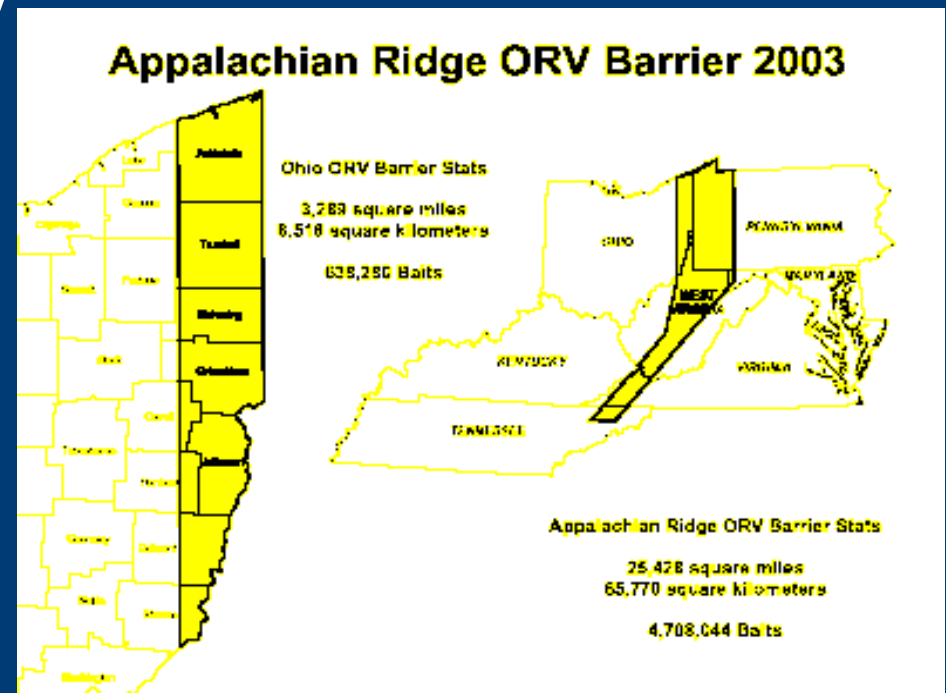
Rabies Positive Raccoons, Ohio compared to Other States



## 8. Program Maintenance

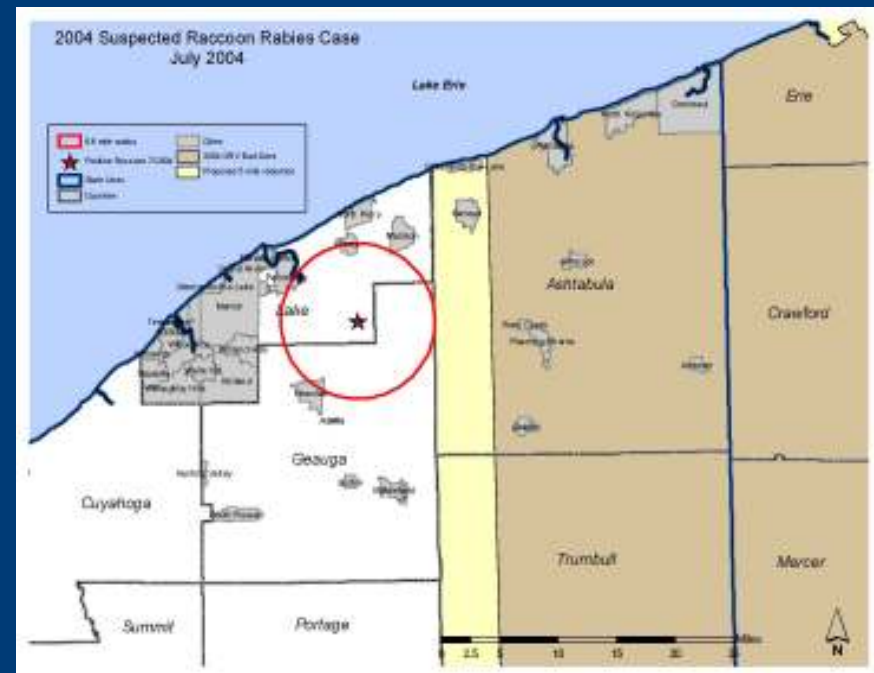
- 2002
  - Ohio area stable
    - Reduce to once per year baiting
  - ORV Expansion into 5 states
    - Appalachian Ridge ORV Program

- 2003
  - Resources Reduced
  - Less Surveillance



# New Focus: 2004

- Index Case: July 20
- Within a week USDA was in the field coordinating active surveillance
- Within 3 weeks, ORV Operation conducted.
- Excellent networking & support from local health departments
- PR efforts were well coordinated; We were credible to the public

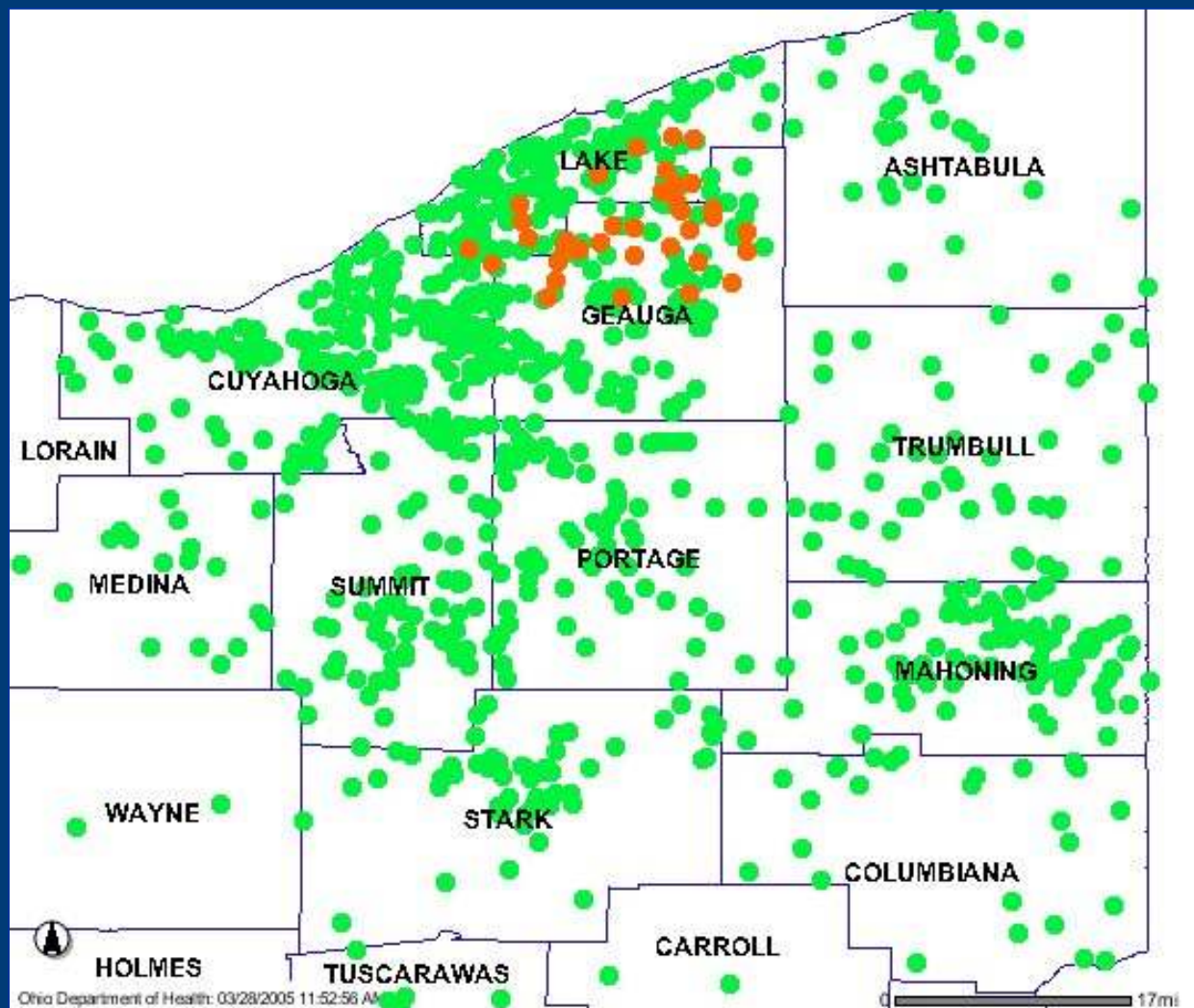


# Steps of Strategic Planning

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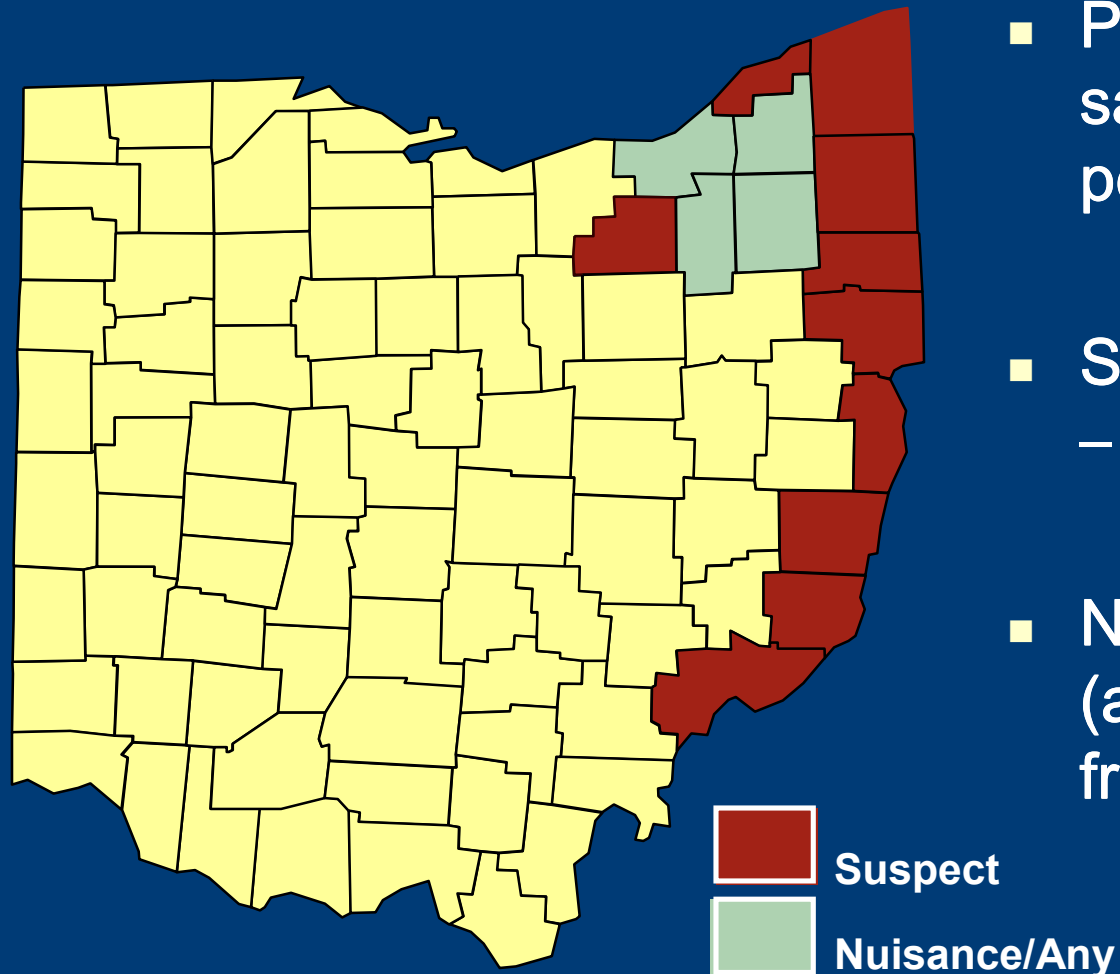
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## Ohio RSR Cluster, 2004



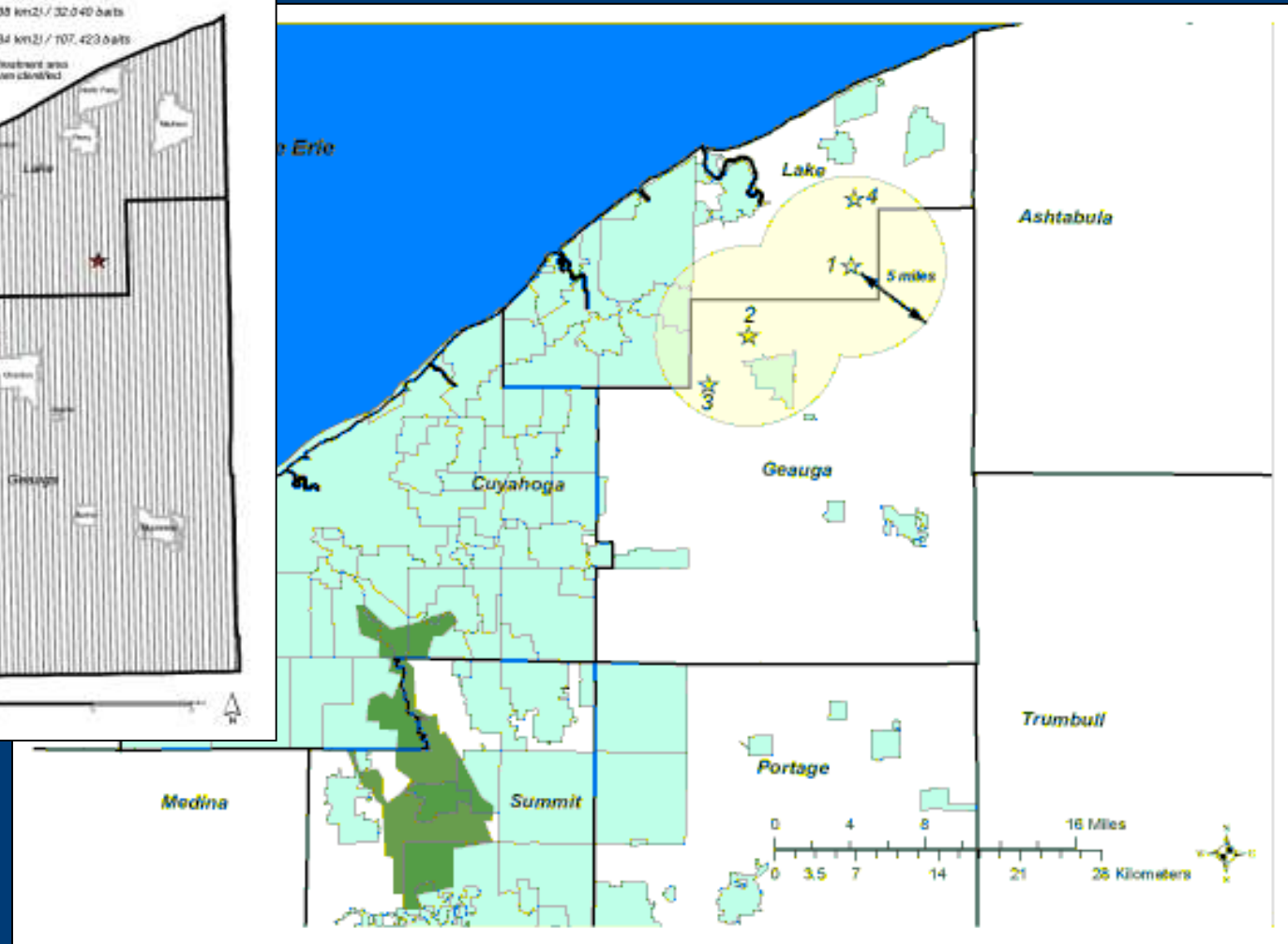
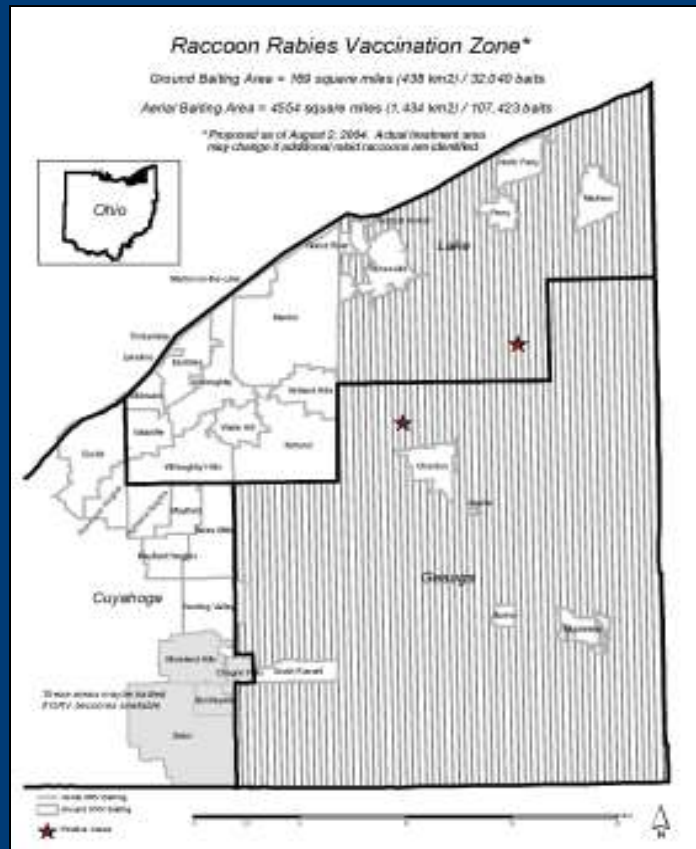
45/875 in 3  
counties

# Target County for Rabies Surveillance, 2004-2005



- Public health samples – human & pet exposures
- Suspect Raccoons – sick, dead, roadkill
- Nuisance Animals (apparently healthy) from target areas

# Emergency ORV Operation: Aug 8, 2004



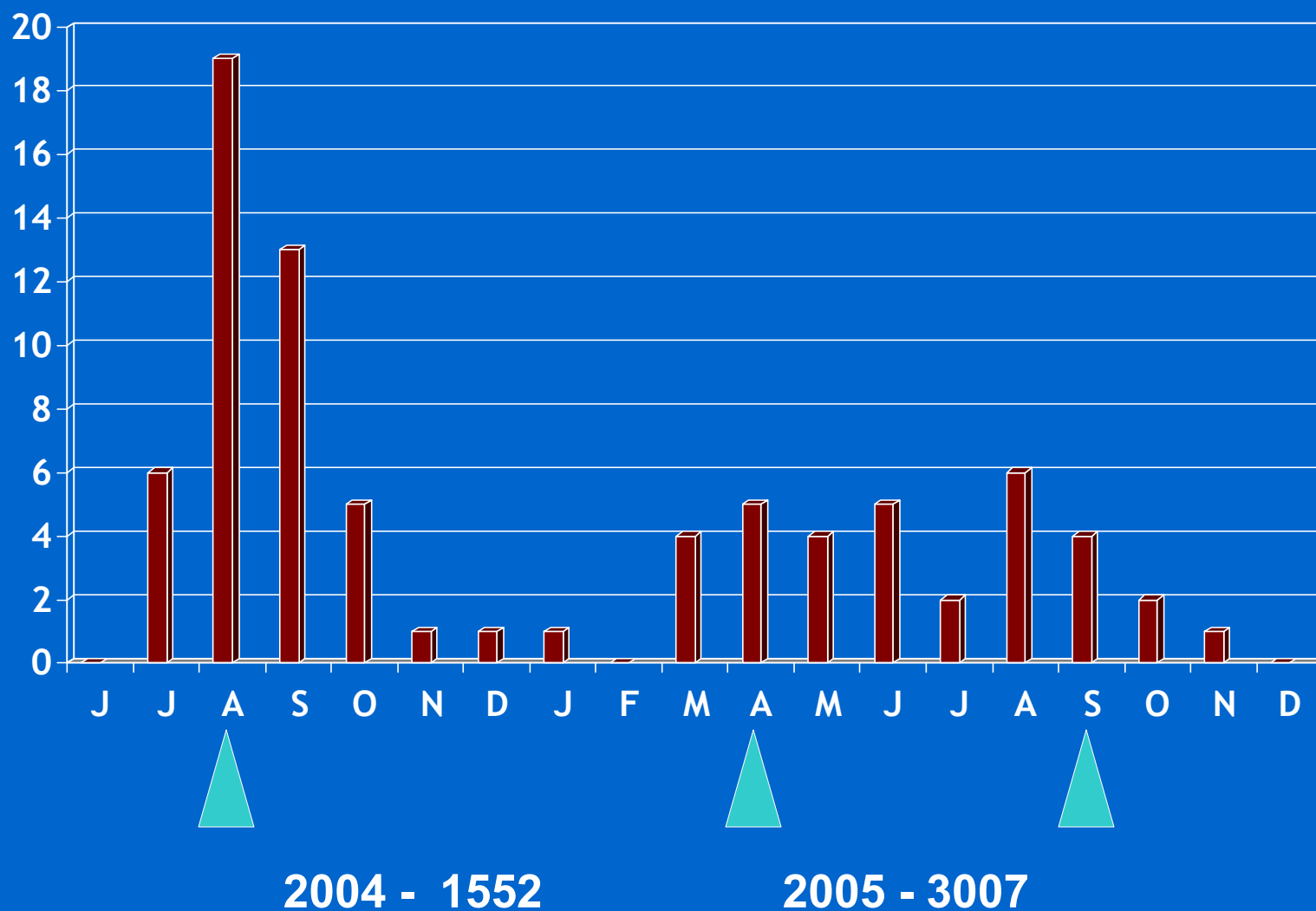


# 2005 RSR Response Plan

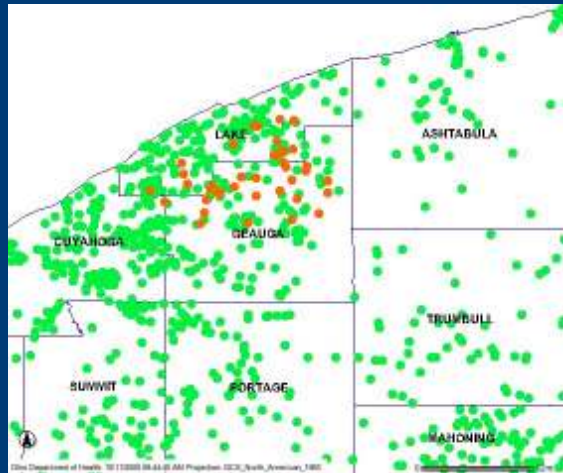
- Continued surveillance
  - USDA enhanced surveillance
  - LHD & ODH Public health surveillance
- Encourage Traditional Prevention Measures
- ORV Operations
  - Once per year border operation (September)
  - Twice per year in new focus (April & Sept)
  - Aerial operations will all be coated sachet



# Raccoon Rabies In Northeast Ohio 2004 and 2005



# Raccoons-strain Rabies Case Distribution

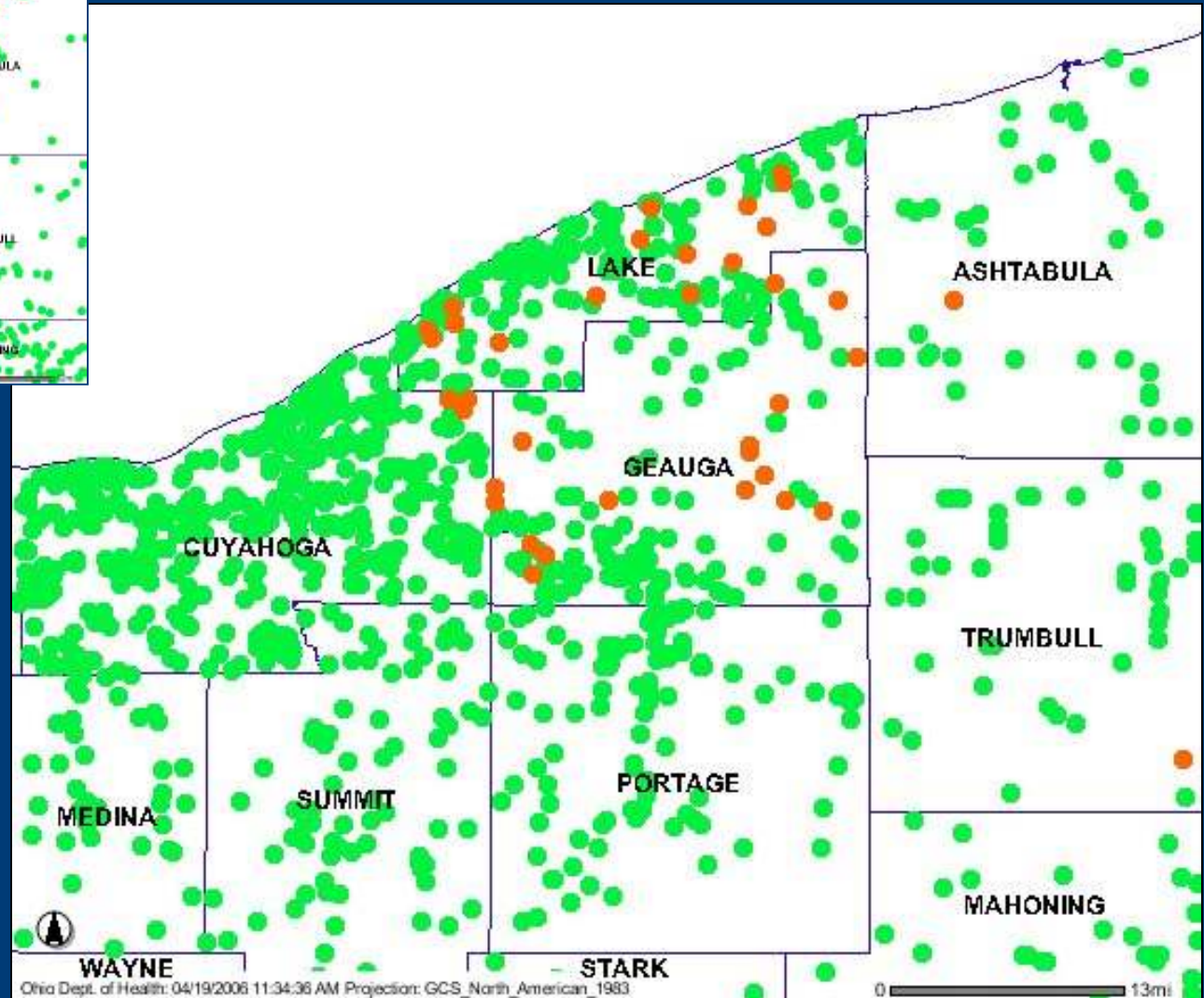


2004 (45 raccoons)

2005

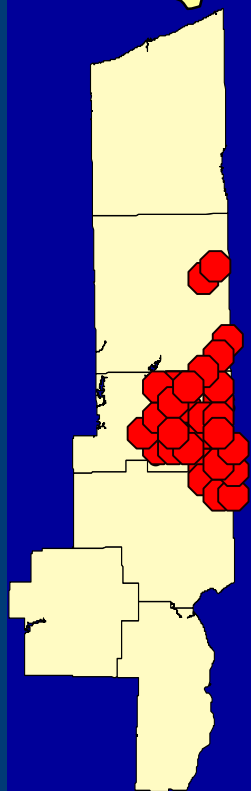
34 raccoons

4 other RSR





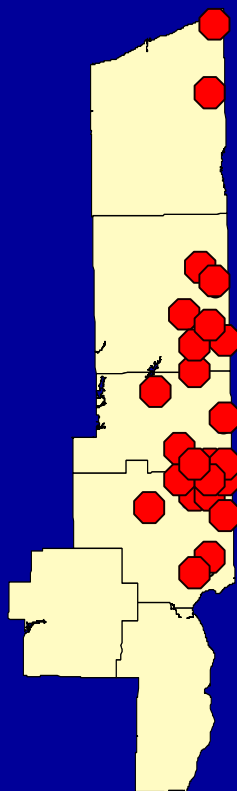
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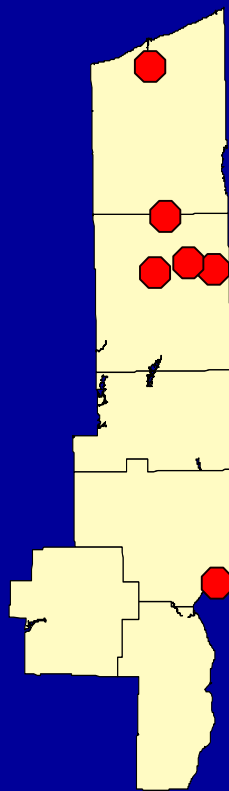
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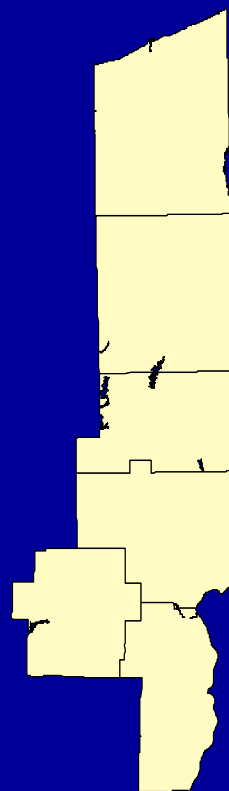
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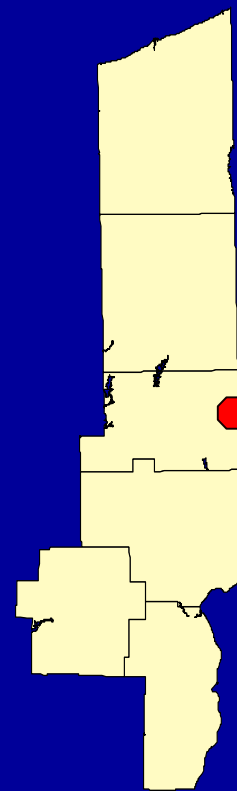
**2\*x**



**2000**

**0**

**2x**

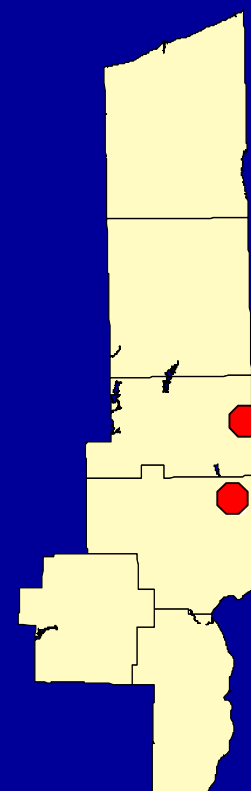


**2001&2**

**1 ea**

**2x**

**1x**



**2003**

**2**

**1+x**

## 7. Evaluation and Reassessment

### Could this have been avoided?

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- Reduced baiting frequency
- Spring vs. fall baiting
- Not enough surveillance being done in border counties
- Dropping surveillance support in secondary counties in 2003(Grant & Contracts)
- Insufficient control/public education regarding movement of rabies vector species

## 7. Evaluation and Reassessment

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- Which is better – CS or FMP
  - CS more economical, less damaging
  - There are more human exposures to vaccine
  - Is uptake and serology as good?
- Timing of Baiting
  - One vs. twice a year
  - Spring vs. Fall. Is one better
- Surveillance: Best sampling criteria
  - Public health versus enhanced surveillance

# 2004 Raccoon Surveillance

(Lake\*, Geauga\*, Cuyahoga\*, Summit, Portage)

Reason for Testing	Pos/Tot	Percent Positive
Human Exposure	2/26	7.7%
Pet Exposure	13/52	25.0%
Odd/Sick/Dead	26/403	6.5%
Nuisance	4/590	6.8%
Total	45/1061	4.2%

\*counties with RSR cases

# 2005 Raccoon Surveillance

(Lake\*, Geauga\*, Cuyahoga\*, Summit, Portage)

Reason for Testing	Pos/Tot	Percent Positive
Human Exposure	1/27	3.7%
Pet Exposure	11/73	15.1%
Odd/Sick/Dead	20/514	3.9%
Nuisance	0/2018	0%
Total	32/2632	1.2%

\*counties with RSR cases

Cuyahoga = 1,673 nuisance raccoons



# What Now for 2006

- Continue surveillance
  - Maintain our surveillance (expanded to 14 counties)
  - Less emphasis on nuisance animals
- Twice a year baiting in New Area
  - Spring and fall at least through 2007
- RSR spread into urban Cuyahoga County would be a major setback
- This summer will be important



# Can Raccoon Rabies be Stopped?







[Zoonotic Diseases](#)

[Vector Borne Diseases](#)

[West Nile Virus](#)

[Rabies](#)

[Oral Rabies Vaccination](#)

[Animal Bites](#)

[Publications & Forms](#)

## Zoonotic Diseases

A zoonotic disease is a disease which can be transmitted from animals to humans. The disease may or may not produce clinical illness in the animal. The Zoonotic Disease Program is focused on preventing transmission of diseases from animals to humans.

Zoonotic diseases include:

- Those which can be transmitted directly from animals to humans (e.g. rabies)
- Diseases that can be acquired indirectly by humans through ingestion, inhalation or contact with infected animal products, soil, water, or other environmental surfaces which have been contaminated with animal waste or a dead animal (e.g. leptospirosis, anthrax)
- A disease which has an animal reservoir, but requires a mosquito or other arthropod to transmit the disease to humans (e.g. St. Louis encephalitis, Rocky Mountain spotted fever)

*External links to other sites are intended to be informational and do not have the endorsement of the Ohio Department of Health.*

[Healthy Pets Healthy People](#)

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# How could RSR get through the immune barrier?

- Natural movement
  - Rare wandering animal could travel through the barrier.
  - If infected, could set up a focus
- Translocation
  - Intentional
    - – nuisance animals, sport, commerce
  - Unintentionally or conveyance
    - Train, truck
- Contingencies for a breach have always been planned for